

## CLAIMS

1. A magnetic sensor comprising:
  - a bias magnet having a bottom surface and at least one side surface oriented generally perpendicularly in relation to said bottom surface, said bias magnet providing a magnetic field;
  - 5 a magnetically sensitive element facingly adjacent said at least one side surface of said bias magnet; and
  - a magnetic target located adjacent said bottom surface of said bias magnet and adjacent said magnetically sensitive element disposed in movable relation with respect thereto, said magnetic target wheel comprising a
  - 10 plurality of predetermined magnetic irregularities which magnetically affect said magnetic field of the bias magnet sensed by the magnetically sensitive element as said magnetic target moves in relation to said bias magnet and said magnetically sensitive element.
2. The magnetic sensor of Claim 1, wherein said magnetic field of said bias magnet is oriented substantially parallel to a direction of movement of said magnetic irregularities of said magnetic target, and wherein said magnetically sensitive element is sensitive to a component of said magnetic
- 5 field which is parallel to the direction of movement.
3. The magnetic sensor of Claim 2, wherein said plurality of magnetic irregularities comprise a serially arranged pattern of teeth and slots, each tooth being separated from an adjacent tooth by a respective slot, wherein the slots have a predetermined slot width in the direction of the movement, and
- 5 said bias magnet has a predetermined magnet length in the direction of the movement.

4. The magnetic sensor of Claim 3, wherein said magnet length is greater than substantially fifty percent of said slot width, wherein said magnetically sensitive element provides a single frequency output signal in response to movement of said magnetic irregularities of said magnetic target.

5 5. The magnetic sensor of Claim 4, wherein said output signal has a maximum and a minimum, wherein a first slope pertains to said output signal going from said minimum to said maximum and a second slope pertains to said output signal going from said maximum to said minimum, wherein said first and second slopes are mutually different.

6. The magnetic sensor of Claim 4, wherein said magnetically sensitive element is selected from the group comprising a Hall effect device, a semiconductor magnetoresistor, a permalloy magnetoresistor and a giant magnetoresistor.

7. The magnetic sensor of Claim 6, wherein said magnetically sensitive element has a lower edge located in substantial alignment with said bottom surface of said bias magnet.

8. The magnetic sensor of Claim 4, wherein said magnet length is at least substantially between seventy percent and one hundred percent of said slot width.

9. The magnetic sensor of Claim 8, wherein said output signal has a maximum and a minimum, wherein a first slope pertains to said output signal going from said minimum to said maximum and a second slope pertains to said output signal going from said maximum to said minimum, wherein said  
5 first and second slopes are mutually different.

10. The magnetic sensor of Claim 9, wherein said magnetically sensitive element has a lower edge located in substantial alignment with said bottom surface of said bias magnet.

11. The magnetic sensor of Claim 3, wherein said magnet length is less than substantially fifty percent of said slot width, wherein said magnetically sensitive element provides a double frequency output signal in response to movement of said magnetic irregularities of said magnetic target.

12. The magnetic sensor of Claim 11, wherein said magnetically sensitive element is selected from the group comprising a Hall effect device, a semiconductor magnetoresistor, a permalloy magnetoresistor and a giant magnetoresistor.

13. The magnetic sensor of Claim 12, wherein said magnetically sensitive element has a lower edge located in substantial alignment with said bottom surface of said bias magnet.

14. The magnetic sensor of Claim 1, wherein said magnetic field of said bias magnet is oriented substantially perpendicular to a direction of

movement of said magnetic irregularities of said magnetic target, and wherein  
said magnetically sensitive element is sensitive to a component of said magnetic  
5 field which is perpendicular to the direction of movement.

15. The magnetic sensor of Claim 14, wherein said magnetic  
irregularities comprise a serially arranged pattern of teeth and slots, each tooth  
being separated from an adjacent tooth by a respective slot.